STATIC LOAD TEST – A COMPARISON OF ULTIMATE LOAD BETWEEN STATNAMIC AND MAINTAINED LOAD TEST

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To everybody,

thank you so much

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ABSTRACT

This study is conducted to give a good comparison of the ultimate load between the statnamic load test and the maintained load test. The study was done using three methods to predict the ultimate load of statnamic load test. The three methods are the Unloading Point Method, Matsumoto method and Simultaneous Equation method. The statnamic and maintained load test was done on two types of bored pile that are bored pile cast on limestone rock and bored pile cast on granite rock. The result shown in the study gave a different outcome. From the settlement-load curves derived, the result for the comparison of statnamic and maintained load test for bored pile cast on limestone gave an almost similar result. Thus, it can be said that the result for both statnamic and maintained load test can be used to determine the ultimate capacity of the pile. Where else, the result for bored pile cast on granite rock gave a very large difference due to large difference of length for the two bored pile. Therefore, it can be conclude that the result for this study on comparison of statnamic load test and maintained load test for bored pile cast on granite can not be used.

ABSTRAK

Projek ini dijalankan untuk memcari perbandingan kekuatan maksima di antara ujian beban statnamic dan ujian beban tertahan. Projek ini dijalankan menggunakan 3 kaedah berbeza bagi menentukan beban maksima dari ujian beban statnamic. 3 kaedah itu adalah kaedah pembebanan titik, kaedah Matsumoto dan kaedah penyelesaian persamaan serentak. Ujian statnamic dan beban tertahan telah dilakukan ke atas dua jenis *bored pile* iaitu cerucuk yang ditanam di atas batuan kapur dan di atas batuan granit. Ujian telah memberikan keputusan yang berbeza. Bagi keputusan ujian statnamic dan beban tertahan ke atas cerucuk di atas batuan kapur memberikan hasil yang lebih kurang sama tetapi bagi cerucuk yang terletak di atas batuan granit tidak. Ini berkemungkinan di sebabkan oleh perbezaan kedalaman yang sangat ketara. Oleh itu, bolehlah dikatakan bahawa perbandingan bagi ujian statnamic dan ujian beban tertahan bagi cerucuk yang dikorek di atas batuan granit bagi projek adalah gagal dan tidak boleh dibandingkan.

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CHAPTER 1

INTRODUCTION

In every construction, foundation is one of the vital component that need a lot of attention whether in design or in construction. Choosing the correct foundation for a certain project is important to ensure a stable and longer life span of the structure. History shows that the usage of foundation in a structure is not new as it has been long use since man starts built a structure. Until now, there are a lot of efforts to increase the potency of foundation. This effort can also be seen with the introduction of variety of testing that would be suitable to see the effectiveness of foundation use. One of the study use in foundation especially pile foundation is static loading. There are several tests that can be used including statnamic load testing. This method is not new in construction engineering and been used in the west countries since 1988. The Statnamic test has now gained some attention in local construction since it has been used in 1994. Therefore, a study is needed in ensuring that this test can be used effectively in our construction industry

1.1 Objectives

The objectives that would be achieved in this study are:

i. The advantages and the disadvantages of the statnamic load test compared to the ordinary maintained load test.

ii. A comparison between the statnamic loading test and the typical maintained load test based on the settlement result and the ultimate bearing capacity of pile.

iii. A comparison between the statnamic load test and the maintained load test based on different types of soils.

1.2 Scopes

The scopes of this study are:

i. To compare statnamic test result on bored pile size 750mm diameter with maintained load test result on bored pile size 1050mm diameter cast on limestone rock.

ii. To compare the statnamic test result and maintained load test result on bored pile cast on limestone rock based on three methods of calculation (Unloading Point method, Matsumoto method and Simultaneous Equation method).

iii. To compare statnamic test result on bored pile size 1800mm diameter with maintained load test result on bored pile size 1200mm diameter cast on granite rock.

iv. To compare the statnamic test result and maintained load test result on bored pile cast on granite rock based on three methods of calculation (Unloading Point method, Matsumoto method and Simultaneous Equation method).

1.3 Problem statement

Although the usage of foundation especially the pile foundation is not new in the construction industry the people still not satisfy with the outcome of it. The introduction of latest testing devices shows that people still trying to find the most accurate way in predicting the pile behaviour. Typically several tests will be done for pile to show the integrity of the pile and its capacity. This prediction can ensure that the design of the pile meet the requirement needed for the use of the structure.

For capacity load testing of pile, several tests can be used in determining the pile capacity. The typical static load test that can show pile capacity and its settlement is the maintained load test or *kentledge* load test. This test gives an accurate result of the pile capacity and its settlement. Although this test gives a nearly perfect result of the pile behaviour but it does have several limitations such as long test time and it required a 24-hour close monitoring of the test.

In order to overcome this problem, several choices of tests that would give almost the same result as the ordinary maintained load test have been introduced

including the statnamic load test. This test has actually been used in the European countries since 1988 and has gained a lot of reputation on it. This statnamic load test already came to Malaysia in 1994 and has been used in a lot of projects in the country.

Although it has been almost 11 years since it been introduced here but there are least studies been carried out in comparing the statnamic load test to the ordinary maintained load test. Therefore, this study will be conducted to compare the statnamic load test to the ordinary maintained load test based on Malaysia condition.

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